

Hospital Electronic Syndromic Surveillance (HESS) HL7 Implementation Guide

HL7 version 2.3.1
Includes Inpatient Admissions,
Emergency Department Registrations and Updates

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Missouri Department of Health and Senior Services

This implementation guide contains descriptions of HL7 version 2.3.1 message types ADT^A01, ADT^A04, and ADT^A08 to be sent from hospitals and urgent care facilities for inpatient admissions, emergency department visits and urgent care facility visits. These messages are sent to Missouri Department of Health and Senior Services for syndromic surveillance purposes.

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1 HESS Message Infrastructure

1.1 Introduction

Missouri Department of Health and Senior Services (MDHSS) will use Chief Complaint information from HL7 version 2.3.1 Admit-Discharge-Transfer (ADT) messages to provide an early warning system of public health emergencies and for general public health surveillance and analysis. The data collection portion of this system is called the Hospital Electronic Syndromic Surveillance (HESS) System. Only the following message types will be accepted:

- ADT^A01 Inpatient Admission
- ADT^A04 Emergency Department Registration
- ADT^A08 Updates to information on previously sent A01 and A04 messages.

This Implementation Guide is based on standard HL7 version 2.3.1 with further constraints specifically for syndromic surveillance requirements. For more information on HL7, go to <http://www.hl7.org/>.

1.2 Basic HL7 Terms

Table 1.2 Basic HL7 Terms	
Term	Definition
Message	A message is the entire unit of data transferred between systems in a single transmission. It is a series of segments in a defined sequence, with a message type and a trigger event.
Segment	A segment is a logical grouping of data fields. Segments within a defined message may be required or optional and may occur only once or may be allowed to repeat. Each segment is named and is identified by a segment ID, a unique 3-character code.
Field	A field is a string of characters. Each field has an element name and is identified by the segment it is in and its sequence within the segment. Usage and cardinality requirements are defined in the Segment Definitions.
Component	A component is one of a logical grouping of items that comprise the contents of a coded or composite field. Within a field having several components, not all components are necessarily required to be populated.
Data Type	A data type restricts the contents and format of the data field. Data types are given a 2- or 3- letter code. Some data types are coded or composite types with several components. The applicable HL7 data type is listed in each field definition.
Delimiters	The delimiter values are given in MSH-1 and MSH-2 and are used throughout the message. The delimiters supported by HESS are: Field Separator ^ Component Separator & Sub-Component Separator ~ Repetition Separator \\ Escape Character

1.3 Data Types for HESS Implementation Guide

The following Data Types have been used in the HESS HL7 Implementation Guide.

Table 1.3	Data Types used in HESS Implementation Guide
Data type	Data Type Name
CE	Coded Element
CM	Composite
CX	Extended Composite ID with check Digit
HD	Hierarchic Designator
ID	Coded Value for HL7-defined tables
IS	Coded Value for user-defined tables
NM	Numeric
PT	Processing Type
SI	Sequence Identifier
ST	String Data
TS	Timestamp
VID	Version Identifier
XAD	Extended Address
XPN	Extended Person Name
XTN	Extended Telephone Number

For further definition of these Data Types, please reference HL7 Standard Version 2.3.1 located at <http://www.hl7.org/>.

1.4 Encoding Rules

- Encode each segment in the order specified in the HESS Message Structure.
- Begin each segment with the 3-letter segment ID (for example "PID").
- End each segment with the carriage return terminator (hex 0D).
- Encode the data fields in the sequence given in the corresponding segment definition tables.
- Encode each data field according to the data type format listed in this guide.
- Components, subcomponents or repetitions that are not valued at the end of a field need not be represented by component separators. Likewise, field separators are not required for empty fields at the end of a segment. For example, the data fields and segments below are equivalent:

^XXX&YYY&&^	is equal to	^XXX&YYY
ABC^DEF^	is equal to	ABC^DEF

MSH|^~\&|APP|MCMC^0131191934^NPI|MOHESS|MODHSS|201009171830||ADT^A04|1|P|2.3.1<cr>

is the same as

MSH|^~\&|APP|MCMC^0131191934^NPI|MOHESS|MODHSS|201009171830||ADT^A04|1|P|2.3.1|||||||<cr>

- If a data segment is not documented in this guide, the segment should not be sent.
- If a data field is not documented in this guide, the data field should not be sent.

1.5 HESS Message Structure Attributes

Table 1.5 HESS Message Structure Attributes	
Attribute	Definition
Segment	A three-character code for the segment plus the square and curly braces structure syntax. If a segment is not documented in this guide, it should not be sent. [XXX] Optional {XXX} Repeating XXX Required [{XXX}] Optional and Repeating
Name	A short, descriptive name of the segment.
Description	Explanation of the use of the segment.
Usage	Describes the use of the segment by HESS. Values used in this implementation are: R Required. Segment must be sent with fields populated according to the segment definition. C Conditional. Must be sent or not sent based on the conditionality statement included in the Description.
Cardinality	Defines the minimum and maximum number of times the segment may appear in this message. [0..1] Segment may be omitted and can have, at most, one occurrence. [1..1] Segment must have exactly one occurrence. [0..*] Segment may be omitted or may repeat an unlimited number of times.

1.6 HESS Message Structure

Table 1.6 HESS Message Structure				
Segment	Name	Description	Usage	Cardinality
MSH	Message Header	Information explaining how to parse and process the message. This includes identification of message delimiters, sender, receiver, message type, timestamp, etc.	R	[1..1]
EVN	Event Type	Trigger event information for receiving application.	R	[1..1]
PID	Patient Identification	Patient identifying and demographic information.	R	[1..1]
PV1	Patient Visit	Information related to this visit at this hospital including the nature of the visit, critical timing information and a unique visit identifier.	R	[1..1]
[PV2]	Patient Visit Additional Information	Admit Reason / Chief Complaint information. PV2 is optional if a DG1 segment is sent. If no DG1 segment is sent, the PV2 segment is required.	C	[0..1]
[{DG1}]	Diagnosis	Admitting Diagnosis and, optionally, Working and Final Diagnosis information. DG1 is optional if a PV2 segment is sent. If no PV2 segment is sent, one or more DG1 segments are required.	C	[0..*]

2 HESS Segment Attributes and Definitions

2.1 HESS Segment Attributes

Table 2.1	Segment Attributes
Attribute	Definition
Sequence (Seq)	Sequence of the elements as they are numbered in the HL7 segment.
Element Name	Descriptive name of a field.
Description	Explanation of the use of the field, component or sub-component.
Value Set	Indicates where valid values for coded fields may be found.
Length (Len)	Maximum length of the field.
Data Type (DT)	A data type restricts the content and format of the data field. Data types are given a 2- or 3- letter code. Some data types are coded or composite types with several components. The applicable HL7 data type is listed in each field definition.
Usage	This indicates whether a field is required, required when the information is available, optional or conditional as specified in the field description. The designations are: R Required. RE Required if available, but may be empty. O Optional. C Conditional, must be populated when the condition (as defined in the field Description) is met; must be empty if the condition is not met. CE Conditional, but may be empty. If the information is known, the field must be populated when the condition (as defined in the field Description) is met; must be empty if the condition is not met or if the information is not known. B Retained for backward compatibility with earlier versions of HL7, but not desired.
Cardinality	Defines the minimum and maximum number of times the field may appear in this segment. [0..1] Field may be omitted and can have, at most, one occurrence. [1..1] Field must have exactly one occurrence.
Not supported	If one or more elements or components of an element are not supported by HESS, this is indicated by a double line. These components or elements should not be populated. See example of double line below:

The required data elements for HESS reporting are located in these segments:

- MSH
- EVN
- PID
- PV1
- PV2 and / or DG1

The rest of this guide identifies the specific formats for these segments. If a segment or field is not listed, do not send it.

2.2 MSH: Message Header Segment Definition

The MSH segment defines the intent, source, destination and some specifics of the syntax of a message.

Example:

MSH|^~\&|ADMITAPP|MYCITY GENL HOSP^0133199346^NPI|MOHESS|MODHSS|201009171830||ADT^A04|201009171830_0268|P|2.3.1<cr>

Table 2.2		MSH: Message Header Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
1	Field Separator	Character to be used as the field separator for the rest of the message. The supported value is " " (ASCII 124).		1	ST	R	[1..1]
2	Encoding Characters	Characters to be used as the component separator, repetition separator, escape character and subcomponent separator. The supported values are: "^~\&" (ASCII 94, 126, 92, and 38)		4	ST	R	[1..1]
3	Sending Application	Identifies the sending application from the other HL7 message exchange applications belonging to the sender. Hospitals frequently send the name of their software vendor or an internally developed system here. Ex: MYEMR-2000		180	HD	O	[0..1]
3.1	Sending Application Name	Name of application or software used to create or send this message. HESS suggests that a shortened name, abbreviation or acronym be used.			IS	O	[0..1]
4	Sending Facility	Identifies the facility where the data contained in this individual message originated (i.e., the "owner" of the message information). Ex: LARGE CO REG MED CTR^9876543210^NPI		180	HD	R	[1..1]
4.1	Sending Facility Name	Name of originating hospital. HESS suggests that a shortened name, abbreviation or acronym be used in the first component. Ex: LOCAL GENL HOSP			IS	R	[1..1]
4.2	Sending Facility ID	Unique identifier for the sending facility. The supported value is the 10-digit National Provider ID.			ST	R	[1..1]
4.3	Sending Facility ID Type	Code system for the universal identifier. If MSH-4.2 contains a National Provider ID, use literal: "NPI".			ID	R	[1..1]
5	Receiving Application	Unique identifier for the receiving application.		180	HD	R	[1..1]
5.1	Receiving Application Name	Literal value: "MOHESS"			IS	R	[1..1]
6	Receiving Facility	Unique identifier for the receiving facility.		180	HD	R	[1..1]

Table 2.2		MSH: Message Header Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
6.1	Receiving Facility Name	Literal value: "MODHSS"			IS	R	[1..1]
7	Date/Time of Message	Date/Time sending system created the message: YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/-ZZZZ] The minimum acceptable precision is to the nearest minute; seconds and microseconds are desirable; the Greenwich Mean Time offset is not required. Ex: 20111209143807		26	TS	R	[1..1]
9	Message Type	All messages will be ADT (Admit-Discharge-Transfer) message types. The triggering event is the real-world circumstance causing the message to be sent. Supported trigger events are A01 (Inpatient Admission), A04 (Emergency Department Registration) and A08 (Update). Ex: ADT^A08		7	CM	R	[1..1]
9.1	Message Type	Literal value: "ADT"			ST	R	[1..1]
9.2	Trigger Event	One of the following literals: "A01", "A04" or "A08"			ST	R	[1..1]
10	Message Control ID	A number or other identifier that uniquely identifies the message and is echoed back in the message acknowledgment segment (MSA). Some hospitals send a Date/Time stamp using microsecond precision or a Date/Time stamp using minute precision plus a sequence number that restarts each day at one or wraps around when it reaches all 9's. Ex: 20101128070123463 or 8X34562 or 201011280701_01234		20	ST	R	[1..1]
11	Processing ID	Indicates how to process the message as defined in HL7 processing rules. Literal values: "P" for Production, "D" for Debug or "T" for Training.		3	PT	R	[1..1]
12	Version ID	The version of HL7 encoding for this message. Literal value: "2.3.1".		8	VID	R	[1..1]

2.3 EVN: Event Type Segment Definition

The EVN segment is used to communicate trigger event information to receiving applications.

Example:

EVN||201011281246

Table 2.3		EVN: Event Type Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
1	Event Type Code	Identifies the trigger event for this message. Use the value from MSH-9.2 Trigger Event (i.e., one of the following literals: "A01", "A04" or "A08").		3	ID	B	[0..1]
2	Recorded Date/Time	Most systems default to the system Date/Time when the transaction was entered. YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/-ZZZZ] The minimum acceptable precision is to the nearest minute; seconds and microseconds are desirable; the Greenwich Mean Time offset is not required. Ex: 20111209143807		26	TS	R	[1..1]

2.4 PID: Patient Identification Segment Definition

The PID segment is used as the primary means of communicating patient identification information. This segment contains patient identifying and demographic information that does not change frequently.

Examples:

PID|1||99XYZ8877||BRADFORD^BRADLEY^B^^PHD||20040908|M||B|123 W MAIN ST - APT 234^^JEFFERSON CITY^MO^65109-1234^USA^051||^573^1231234||||||H||||||201104290345|Y<cr>

PID|1||95101100001||SMITH^STANLEY^SAMUEL^SR||19580704|M||W|123 PARTY COVE ST^APT G^OSAGE BEACH^MO^65065^^029|029|^573^1234567||||123456789||||N||||N<cr>

Table 2.4		PID: Patient Identifier Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
1	Set ID	Numbers the repetitions of the segments. Only one patient per message is supported. Literal value: "1".		4	SI	R	[1..1]
3	Patient Identifier List	Patient's Medical Record Number from the hospital which is submitting this report to public health officials. No repetitions; only the first component is required. Ex: 95101100001 or M00189645		20	CX	R	[1..1]
3.1	Patient ID	Patient Medical Record Number. This value is to be the same each time the patient visits the hospital.			ST	R	[1..1]
5	Patient Name	Legal name of the patient as recorded at the hospital. No repetitions. Ex: BRADFORD^BRADLEY^B		48	XPN	R	[1..1]
5.1	Last Name	Patient last name. Ex: BRADFORD If no information is available, send: nodata			ST	R	[1..1]
5.2	First Name	Patient first name. Ex: BRADLEY If no information is available, send: nodata			ST	R	[1..1]
5.3	Middle Initial/Name	Patient middle initial or middle name. Ex: B			ST	O	[0..1]
5.4	Suffix	Patient last name suffix. Ex: SR or JR			ST	O	[0..1]
5.5	Prefix	Patient name prefix. Ex: MRS or DR			ST	O	[0..1]
5.6	Degree	Degree, license or certification. Ex: MD or PHD			IS	O	[0..1]
7	Patient Date/Time of Birth	Patient's date of birth. YYYYMMDD[HH[MI[SS[.S[S[S[S]]]]]] [+/-ZZZZ] Preferred precision is to the nearest day; time components may be sent if they are known; the Greenwich Mean Time offset is not required. Ex: 19580704 or 200409081426		26	TS	R	[1..1]
8	Patient Sex	Code for the sex of the patient. Ex: M, F or U	Table 0001	1	IS	R	[1..1]

Table 2.4		PID: Patient Identifier Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
10	Patient Race	Code for the race of the patient. No repetitions. Ex: W or A or M^MULTIRACIAL (text is optional)		80	CE	R	[1..1]
10.1	Race Code	Standardized code for patient race.	Table 0005		ST	R	[1..1]
10.2	Race Text	Standardized description associated with the code in PID-10.1. Ex: U^UNKNOWN (text is optional)	Table 0005		ST	O	[0..1]
11	Patient Address	Primary residence address of the patient. No repetitions. Ex: 123 W MAIN ST - APT 234^JEFFERSON CITY ^MO^65109-1234^USA 123 PARTY COVE ST^APT G^OSAGE BEACH ^MO^65065^USA^^029	USPS format for street address, other designation (e.g. "APT 312"), city, state and zip are preferred.	106	XAD	R	[1..1]
11.1	Street Address	First line of the patient's home address. Ex: 123 W MAIN ST - APT 234			ST	R	[0..1]
11.2	Other Designation	Second line of street address or Post Office box. Ex: APT G or PO BOX 123			ST	O	[0..1]
11.3	City	City portion of patient's home address. Ex: OSAGE BEACH			ST	R	[1..1]
11.4	State	Two-character postal abbreviation for the state portion of patient's home address. Ex: MO KS IL			ST	R	[0..1]
11.5	Zip Code	Postal code portion of the patient's home address. Extended zip code values are not required but may be sent. Ex: 65065 or 65109-1234			ST	R	[0..1]
11.6	Country	HESS recognizes two, three and four-character standard country codes. For the United States, use either "US" or "USA". If the Country Code is not known, send the name of the country as free text. Ex: NIGERIA.	Table 0212 has a short list of countries & codes. A standard list of other codes is at: http://www.answers.com/topic/list-of-fips-country-codes		ID	RE	[0..1]
11.9	County	Three-digit county FIPS code for the county in which the patient resides. Ex: 029 (Camden Co, MO) or 510 (St Louis City, MO)	Table 0289		IS	R	[1..1]
12	County Code	Allowed as an alternate location for County FIPS Code for backwards compatibility.	Table 0289	4	IS	B	[0..1]
13	Patient Phone Number - Home	Primary home phone number of the patient. No repetitions. The preferred location is in components PID-13.6 and 13.7. Ex: ^^^573^1234567 or ^^^512^5551212		40	XTN	R	[1..1]

Table 2.4		PID: Patient Identifier Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
13.1	Formatted Phone Number	Formatted primary home phone number of the patient. PID-13.1 is allowed for backward compatibility only and, if populated, must be in the format: (999)999-9999. Ex: (512)555-1212			ST	B	[0..1]
13.5	Country Code	Many systems do not collect a foreign phone number and patients from other countries often provide a local contact number. However, a Country Code is allowed.			NM	O	[0..1]
13.6	Area Code	Unformatted area, city or region code of patient's home phone number. Ex: 573			NM	R	[1..1]
13.7	Phone Number	Unformatted exchange and station portions of patient's home phone number. Ex: 1234567			NM	R	[1..1]
13.8	Extension	Although extensions are seldom used with a home phone number, HESS supports their use. Ex: 0123			NM	O	[0..1]
19	Patient Social Security Number	Unformatted 9-digit social security number of patient. Ex: 123456789		16	ST	O	[0..1]
22	Patient Ethnic Group	Further defines the patient's ancestry as Hispanic, Non-Hispanic or Unknown. No repetitions. Ex: H or N or N^NON-HISPANIC (text is optional)		80	CE	R	[1..1]
22.1	Ethnic Group Code	Standardized code for the ethnicity of the patient. Literal values: "H" or "N" or "U"	Table 0189		ST	R	[1..1]
22.2	Ethnic Group Text	Standardized description associated with the code in PID-22. Ex: U^UNKNOWN (text is optional)	Table 0189		ST	O	[0..1]
29	Patient Death Date and Time	Required if PID-30 Patient Death Indicator = "Y". YYYYMMDD[HH[MI[SS[S[S[S[S]]]]]]] [+/-ZZZZ] The minimum acceptable precision is to the nearest day; time components are desirable; the Greenwich Mean Time offset is not required. Ex: 20110319 or 20110319041627		26	TS	C	[0..1]
30	Patient Death Indicator	Code indicating if the patient is deceased. Ex: Y (the patient died) or N (the patient is still alive)	Table 0136	1	ID	R	[1..1]

2.5 PV1: Patient Visit Segment Definition

The PV1 segment is used by Registration/Patient Administration applications to communicate information on a visit-specific basis.

Examples:

PV1|1|E|E|||||||7|||||8399193|||||||20091209031420<cr>

Table 2.5		PV1: Patient Visit Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
1	Set ID	Numbers the repetitions of the segments. Only one per patient per message is supported. Literal value: "1".		4	SI	O	[0..1]
2	Patient Class	Patient Class does not have a consistent industry-wide definition and is subject to site-specific variations. HESS supports only messages with Patient Class = E (Emergency Department visits) or I (Inpatient Admission). Literal values: "E" or "I"	Table 0004	1	IS	R	[1..1]
4	Admission Type	Indicates the circumstances under which the patient was seen or will be admitted. Literal values: "E", "A", "L" or "R"	Table 0007	2	IS	R	[1..1]
14	Admit Source	Indicates the place from which the patient was admitted or referred. Sometimes known as the Referral Source. If this information is not known or not collected, use 9 (Information not available) as a default. HESS accepts values from the Uniform Billing-92 (UB-92) Field 20 codes. Ex: 1, 7 or 9	Table 0023	3	IS	R	[1..1]
19	Visit Number	Unique identifier for this visit by this patient at this hospital. Ex: 8399193 or 20111209-00247		20	CX	R	[1..1]
19.1	Visit Identifier	Unique identifier assigned to each patient visit. Ex: V0000184230			ST	R	[1..1]
44	Admit Date/Time	Date and time when the patient was admitted or registered in the Emergency Department. YYYYMMDDHHMM[SS[.S[S[S[S]]]]] [+/-ZZZZ] The minimum acceptable precision is to the nearest minute; seconds are desirable; the Greenwich Mean Time offset is not required. Ex: 20110427035743 or 201104271557		26	TS	R	[1..1]

2.6 PV2: Patient Visit Additional Information Segment Definition

Note: The preferred method of reporting Chief Complaint data is using a PV2 segment. However, the DG1 segment is also supported and may be sent either in addition to a PV2 segment or in place of the PV2 segment.

The PV2 segment is a continuation of visit-specific information and is the segment where the Chief Complaint data is passed. This was done to leverage against existing clinical information systems where Chief Complaint is sent in PV2-3 Admit Reason. This element is a CE data type and the Chief Complaint text may be sent as free text in the second component of PV2-3 Admit Reason.

Examples:

PV2|||625.9^PELVIC PAIN^I9<cr>

PV2||| ^ABDMNAL PAIN<cr>

Table 2.6		PV2: Patient Visit Additional Information Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
3	Admit Reason	Short description of the reason for patient's visit. If the description text has been identified with a code, the code must also be sent. Ex: ^FEVER/COUGH, HA or 112.0^THRUSH^I9		60	CE	R	[1..1]
3.1	Admit Reason Code	If an ICD-9, ICD-9-CM or ICD-10 code has been identified for the text in PV2-3.2, the code must be sent. Codes may be sent with or without embedded periods. Ex: V72.9 or V729, 454.0 or 4540, 945.22 or 94522			ST	RE	[0..1]
3.2	Admit Reason Text	Short description relating only to the reason for the patient's visit. Any abbreviations used should be common to industry practice. Even if a code has been sent in PV2-3.1, this text component must be sent. Ex: "DIZZY, NAUSEA" or "PARALYSIS NOS"			ST	R	[1..1]
3.3	Admit Reason Coding System	Name of standardized coding scheme used for the code in PV2-3.1. If no code was specified in PV2-3.1, there is no need to populate this component. ICD9 is the preferred coding methodology. Literal values: "I9" (ICD-9) or "I9C" (ICD-9-CM) or "I10" (ICD-10)	Table 0053		ST	C	[0..1]

2.7 DG1: Diagnosis Segment Definition

The DG1 segment contains patient diagnosis information of various types. The DG1 segment may be sent either in addition to a PV2 segment or in place of the PV2 segment. HESS supports Admitting, Working and Final Diagnosis types. HESS also supports both a segment layout that places the code, text and coding system in separate elements (3, 4 and 2, respectively) and a layout that places them in the first three components of DG1-3 as shown in the Segment Definition below. Regardless of whether a code is sent, the diagnosis text must be sent.

Examples:

DG1|1||I9C|789.00|ABDMNAL PAIN UNSPCF SITE||A<cr>

DG1|1||^SPRAIN LUMBAR REGION^||F<cr>

DG1|1||8472^SPRAIN LUMBAR REGION^I9||F<cr>

Table 2.7		DG1: Diagnosis Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
1	Set ID	Numbers the repetitions of the segments. HESS supports repetitions of the DG1 segment. For the first occurrence of the segment the sequence number shall be 1, for the second occurrence it shall be 2, etc.		4	SI	R	[1..1]
2	Diagnosis Coding Method	Name of standardized coding scheme used for the code in DG1-3. If no code was specified in DG1-3.1, there is no need to populate this component. ICD9 is the preferred coding methodology. Literal values: "I9" (ICD-9) or "I9C" (ICD-9-CM) or "I10" (ICD-10)	Table 0053	2	ID	B	[0..1]
3	Diagnosis Code	If an ICD-9, ICD-9-CM or ICD-10 code has been identified for the diagnosis text, the code must be sent in DG1-3.1. The diagnosis text and coding system may either be included as components 2 and 3 of the DG1-3 Coded Element structure or as separate fields in DG1-2 and DG1-4.		60	CE	R	[0..1]
3.1	Diagnosis Code Identifier	If an ICD-9, ICD-9-CM or ICD-10 code has been identified for the text in DG1-3.2 or DG1-4, the code must be sent. Codes may be sent with or without embedded periods. Ex: V72.9 or V729, 454.0 or 4540, 945.22 or 94522			ST	RE	[0..1]

Table 2.7		DG1: Diagnosis Segment Definition					
Seq	Element Name	Description	Value Set	Len	DT	Usage	Cardinality
3.2	Diagnosis Code Text	Short description relating only to the reason for the patient's visit. Any abbreviations used should be common to industry practice. Even if a code has been sent in DG1-3.1, a text component must be sent either here or in DG1-4. Ex: "DIZZY, NAUSEA" or "CHR AIRWAY OBSTRUCT NEC"			ST	R	[1..1]
3.3	Diagnosis Code Coding System	Name of standardized coding scheme used for the code in DG1-3. If no code was specified in DG1-3, there is no need to populate this component. ICD9 is the preferred coding methodology. Literal values: "I9" (ICD-9) or "I9C" (ICD-9-CM) or "I10" (ICD-10)	Table 0053		ST	C	[0..1]
4	Diagnosis Description	Short description relating only to the reason for the patient's visit. Any abbreviations used should be common to industry practice. Even if a code has been sent in DG1-3.1, a text component must be sent either here or in DG1-3.2. Ex: "PARALYSIS NOS" or "CHR AIRWAY OBSTRUCT NEC"		40	ST	B	[0..1]
6	Diagnosis Type	Identifies the type of diagnosis being sent. Literal values: "A" for Admitting diagnosis, "W" for Working diagnosis or "F" for Final diagnosis.	Table 0052	2	IS	R	[1..1]

3 Sample Messages

3.1 A04 Emergency Department Registration; no Updates

```
MSH|^~\&|HLTH-ADT|MID-CO HLTH CTR^9876543210^NPI|MOHESS|MODHSS|201102091114||ADT^A04|201102091114-0078|P|2.3.1<cr>
EVN||201102091114
PID|1||20060012168||DOE^MARY^ANNA||20040923|F||U|2166 WELLS DR^APT B^JEFFERSON CITY^MO^65101^US^^051|
||||^573^1234567||||U||||N<cr>
PV1||E||E||||1||||20110209_0064|||||||20110217144208<cr>
PV2||913.1^ABRASION FOREARM-INFECT^I9<cr>
```

- The Race of the patient is not known; therefore PID-10 contains “U”.
- The Social Security Number of the patient is not known; therefore PID-19 is empty.
- The Ethnicity of the patient is not known; therefore PID-22 contains “U”.
- Since this is an Emergency Department visit, PV1-44 reflects the time the patient registered in the Emergency Department.
- Since the Admit Reason was coded, the code (913.1) in PV2-3.1 and the coding system (I9) in PV2-3.3 are populated.

3.2 A04 Emergency Department Registration followed by A08 Update

```
MSH|^~\&|CITY GENL HOSP^0133195934^NPI|MOHESS|MODHSS|20110217144317||ADT^A04|E100648329|P|2.3.1<cr>
EVN||20110217144317
PID|1||95101100001||DOE^JOHN^Q^JR||19640104|M||B|2166 WELLS DR^APT B^JEFFERSON CITY^MO^65101^USA^^051|
^^^573^5551212||||111223333||H||||N<cr>
PV1||E||E||||1||||8399193|||||||20110217144208<cr>
DG1|1||473.9^CHRONIC SINUSITIS NOS^I9||A<cr>
```

- Since a PV2 segment is not being sent, a DG1 segment is required.
- Since the Diagnosis Text is coded, the code (473.9) in DG1-3.1 and coding system (I9) in DG1-3.3 are populated.
- When DG1 segments are sent, an Admitting Diagnosis (A in DG1-6) is the only diagnosis type that is required; others are optional.

MSH|^~\&|CITY GENL HOSP^0133195934^NPI|MOHESS|MODHSS|20110217145139||ADT^A08|E100648353|P|2.3.1<cr>
 EVN||20110217145139
 PID|1||95101100001||DOE^JOHN^Q^JR||19640104|M||B|2166 WELLS DR^APT B^JEFFERSON CITY^MO^65101^USA^^051||
 ^573^5551212|||||111223333||H|||||N<cr>
 PV1||E||E|||||1||||8399193|||||||20110217144208<cr>
 DG1|1||473.9^CHRONIC SINUSITIS NOS^I9||A<cr>
DG1|2||041.00^STREPTOCOCCUS UNSPEC^I9||F<cr>

- This is an A08 update against the prior message.
- MSH-7 Message Date/Time and MSH-10 Control ID have been updated.
- Note that PV1-19 Visit Number and PV1-44 Admit Date/Time have not changed.
- Once an Admitting Diagnosis has been sent, HESS does not require additional DG1 segments to be sent, but they can be helpful if they relate to the current visit.

3.3 A04 Emergency Department Registration; A01 Inpatient Admission; A08 Updates including patient death

MSH|^~\&|SUPREHRT|OTHER REG MED CTR^1234567890^NPI|MOHESS|MODHSS|201102171531||ADT^A04|201102171531956|P|2.3.1<cr>
 EVN||201102171531
 PID|1||M001059711||DYER^JANE||19651004|F||W|2166 WELLS DR - APT D^JEFFERSON CITY^MO^65101^USA^^051||
 ^573^5551234|||||123456789||N|||||N<cr>
 PV1||E||E|||||7||||V20220217-00274|||||||201102171522<cr>
 PV2||^STOMACH ACHE<cr>

- PV2-3.2 Admit Reason is often sent as free text in which case ICD-9 codes are not required.

MSH|^~\&|SUPREHR|OTHER REG MED CTR^1234567890^NPI|MOHESS|MODHSS|201102171537||ADT^A08|201102171537187|P|2.3.1<cr>
 EVN||201102171537
 PID|1||M001059711||DYER^JANE||19651004|F||W|2166 WELLS DR - APT D^JEFFERSON CITY^MO^65101^USA^^051||
 ^573^5551234|||||123456789||N|||||N<cr>
 PV1||E||E|||||7||||V20220217-00274|||||||201102171522<cr>
 PV2||^STOMACH ACHE<cr>
DG1|1||789.00^ABDMNAL PAIN UNSPCF SITE^I9||A<cr>

- Once a PV2 Admit Reason has been sent, DG1 segments are not required, but they can be helpful if they relate to the current visit.

MSH|^~\&|SUPREHR|OTHER REG MED CTR^1234567890^NPI|MOHESS|MODHSS|201102171658||ADT^A01|201102171658076|P|2.3.1<cr>
 EVN||201102171658
 PID|1||M001059711||DYER^JANE||19651004|F||W|2166 WELLS DR – APT D^^JEFFERSON CITY^MO^65101^USA^^^051||
 ^^^573^5551234|||||123456789||||N||||N<cr>
 PV1|||E|||||7||||V20220217-00274|||||||201102171656<cr>
 PV2||^STOMACH ACHE<cr>
 DG1|1||789.00^ABDMNAL PAIN UNSPCF SITE^I9|||A<cr>
DG1|2||540.9^ACUTE APPENDICITIS NOS^I9|||W<cr>

- The patient from the previous message has now been admitted as an inpatient, so the Trigger Event is A01.
- PV1-2 Patient Class is now “I”.
- In this particular case, PV1-19 Visit Number has remained the same. However, it is recognized that some insurance companies require the Visit Number to be changed when a patient is admitted from the Emergency Department. Either way is fine for HESS.
- Note that PV1-44 Admit Date/Time has been updated with the time of admission as an inpatient.
- Once an Admitting Diagnosis has been sent, Working and Final diagnoses are not required, but they can be helpful if they relate to the current visit.

MSH|^~\&|SUPREHR|OTHER REG MED CTR^1234567890^NPI|MOHESS|MODHSS|201102172334||ADT^A08|201102172334640|P|2.3.1<cr>
 EVN||201102172334
 PID|1||M001059711||DYER^JANE||19651004|F||W|2166 WELLS DR – APT D^^JEFFERSON CITY^MO^65101^USA^^^051||
 ^^^573^5551234|||||123456789||||N|||||201102172241|Y<cr>
 PV1|||E|||||7||||V20220217-00274|||||||201102171656<cr>
 PV2||^STOMACH ACHE<cr>
 DG1|1||789.00^ABDMNAL PAIN UNSPCF SITE^I9|||A<cr>
 DG1|2||540.9^ACUTE APPENDICITIS NOS^I9|||W<cr>
 DG1|3||540.0^AC APPEND W PERITONITIS^I9|||F<cr>

- The patient is expired and this is indicated by the “Y” in PID-30 and the Date and Time of Death in PID-29.

3.4 A01 Inpatient Admission; no Updates

MSH|^~\&|HLTH-ADT|MID-CO HLTH CTR^9876543210^NPI|MOHESS|MODHSS|201110090314||ADT^A01|201110090314-0017|P|2.3.1<cr>
 EVN||201110090314
 PID|1||20100138621||SMITH^SUE^A||19340229|F||M|999 HESS ST^^JEFFERSON CITY^MO^65101^USA^^^051||
 ^^^619^4443333|||||U|||||N<cr>
 PV1|||E|||||6||||20111009_0034|||||||20111009025915<cr>
 DG1|1||E880.9^FALL ON STAIR/STEP NEC^I9|||A<cr>
DG1|2||305.1^TOBACCO USE DISORDER^I9|||F<cr>

- We know that this patient was referred from a nursing home because of the value “6” in PV1-14.
- Note that the historical diagnosis information in the last DG1 does not relate directly to this visit; therefore it does not need to be sent.

Appendix A – Additional Encoding Considerations

A.1 Use of 3-Digit FIPS Codes

FIPS codes are often expressed as a 5-character code made up of the 2-letter state code (available at <www.itl.nist.gov/div897/pubs/fip52.htm>) plus a 3-digit county code (e.g., AZ001 represents Apache County, Arizona and AL001 represents Autauga County, Alabama.). However, since the State is sent in a separate component of the address, HESS requests to receive just the 3-digit county code. Leading zeroes must not be suppressed.

A.2 Coding Considerations for Homeless and International Patients

Difficulties often arise when a patient has supplied an international address. If the patient does not know their 2-character state or province code, websites are available with this information. You may also send the state or province name in the County component.

If you are able to identify when a patient is Homeless or from another country but without a fully populated address, you may consider using the following FIPS codes:

Table A.2 FIPS code usage for the homeless and from other countries			
HL7 Element	Element Name	Value to use for Homeless person	Value to use for non-US person
PID-11.4	State	97	98
PID-11.5	Zip / postal code	99997	99998
PID-11.6	Country	9997	Table 0212
PID-11.9	County	997	998

A.3 Deriving Patient Death Information from Discharge Information

Some hospitals do not capture information in PID-29 Patient Death Date/Time and PID-30 Patient Death Indicator. These hospitals often find they can derive this information from PV1-36 Discharge Status/Disposition and PV1-45 Discharge Date/Time.

Table A.3 Deriving Patient Death Information from Discharge Information		
PV1-36 Discharge Status	PID-29 Death Date/Time	PID-30 Death Indicator
Indicates patient still alive	Leave empty	N
Indicates patient is expired	Use PV1-45 Discharge Date/Time	Y

A.4 Deriving Admission Type

Admission Type does not have a standard industry-wide definition and will likely require a conversion. For example, if you use the Uniform Billing-92 (UB-92) Field 19 codes, your conversion will likely be

Table A.5 Deriving Admission Type from Uniform Billing-92 Codes			
Uniform Billing – 92 Code	Uniform Billing Description	Code to send HESS	HESS Description
1	Emergency	E	Emergency
2	Urgent Care	E	Emergency
3	Elective	R	Routine
4	Newborn	L	Labor & Delivery
5	Trauma (if normally used for motor vehicle or industrial accidents)	A	Accident
9	Information not available	R (Note: HL7 v2.3.1 does not have an option for Unknown)	Routine

The main situation where this field becomes important to HESS is when a patient is admitted after being seen in the Emergency Department. This is because our syndromic surveillance includes emergency circumstance Inpatient data along with Emergency Department visits and Urgent Care visits in some types of analysis. In the case where a patient is admitted after being seen in the Emergency Department, HESS needs to receive “E” in PV1-4 Admission Type.

Many hospitals have found it reasonable to put “E” in PV1-4 Admission Type whenever PV1-14 Admit Source = “7” (Emergency Department). Others have found evidence that the patient was first seen in the Emergency Department by examining values from PV1-6 Prior Patient Location, PV1-10 Hospital Service, PV1-39 Servicing Facility or PV1-43 Prior Temporary Location.

A.6 Visit Number

Unlike Medical Record Number which is expected to stay the same each time the patient visits the hospital, Visit Number is to be unique for each visit by the patient. There are a few exceptions like recurring visits to an Emergency Department to get blood pressure checks, red blood cell counts or dilation measurements. Moreover, some insurance companies require that a new Visit Number be assigned when a patient transfers from the Emergency Department to an Inpatient, while other insurance companies require the Visit Number to stay the same. These exceptions are expected.

Not all hospitals capture a separate value for Visit Number, but many have found that their PID-18 Patient Account Number fulfills the uniqueness requirements for a Visit Number and use PID-18 Patient Account Number to populate PV1-19 Visit Number. Please note that if your Patient Account Number or Visit Number system starts back over at one each year, this does not result in unique visit numbers. One method to make such a sequence number unique is to prefix the number with the year. Others have constructed Visit Numbers using a Date and sequence number that restarts each day at one or wraps around when it reaches all 9's.

Appendix B – HESS Code Sets

Table 0001	Sex (values suggested by HL7 v 2.3.1)
Value	Description
F	Female
M	Male
O	Other
U	Unknown / not stated

Table 0004	Patient Class (values suggested by HL7 v 2.3.1) - Note: The only codes listed are those needed for this implementation guide.
Value	Description
E	Emergency
I	Inpatient

Table 0005	Race (as recommended by CDC)
Value	Description
W	White
B	Black or African American
A	Asian or Pacific Islander
I	American Indian or Alaskan Native
M	Multiracial
O	Other
U	Unknown

Table 0007	Admission Type (values suggested by HL7 v 2.3.1)
Value	Description of circumstance under which patient was seen
E	Emergency
A	Accident
L	Labor and Delivery
R	Routine

Table 0023	Admit Source (values suggested by HL7 v 2.3.1)
Value	Description
1	Physician Referral
2	Clinic Referral
3	HMO Referral
4	Transfer from a Hospital (includes Acute Care)
5	Transfer from a Skilled Nursing Facility
6	Transfer from Another Health Care Facility (includes Nursing Homes)
7	Emergency Room
8	Court/Law Enforcement
9	Information Not Available

Table 0052	Diagnosis Type (values suggested by HL7 v 2.3.1)
Value	Description
A	Admitting diagnosis
F	Final diagnosis
W	Working diagnosis

Table 0053	Diagnosis Coding Method - Note: The only codes listed are those needed for this implementation guide.
Value	Description
I10	ICD-10
I9	ICD9
I9C	ICD-9CM

Table 0136	Yes/No Indicator (from HL7 v 2.3.1)
Value	Description
Y	Yes
N	No

Table 0189	Ethnic Group (as recommended by CDC)
Value	Description
H	Hispanic
N	Non-Hispanic
U	Unknown

Table 0212	Nationality - This table shows selected values only. Note that the table reflects only 3-letter codes. Two-letter and numeric codes are also available. The full ISO 3166 country code set, which is suggested by HL7, is available at: ftp://ftp.ripe.net/iso3166-countrycodes.txt .
Value	Description
CAN	Canada
MEX	Mexico
USA	United States
UMI	United States Minor Outlying Islands

Table 0289	County/Parish - A complete list of FIPS 6-4 US county codes is at: http://www.itl.nist.gov/fipspubs/co-codes/states.htm				
FIPS Code	County Name	FIPS Code	County Name	FIPS Code	County Name
001	ADAIR	079	GRUNDY	157	PERRY
003	ANDREW	081	HARRISON	159	PETTIS
005	ATCHISON	083	HENRY	161	PHELPS
007	AUDRAIN	085	HICKORY	163	PIKE
009	BARRY	087	HOLT	165	PLATTE
011	BARTON	089	HOWARD	167	POLK
013	BATES	091	HOWELL	169	PULASKI
015	BENTON	093	IRON	171	PUTNAM
017	BOLLINGER	095	JACKSON	173	RALLS
019	BOONE	097	JASPER	175	RANDOLPH
021	BUCHANAN	099	JEFFERSON	177	RAY
023	BUTLER	101	JOHNSON	179	REYNOLDS
025	CALDWELL	103	KNOX	181	RIPLEY
027	CALLAWAY	105	LACLEDE	183	ST. CHARLES
029	CAMDEN	107	LAFAYETTE	185	ST. CLAIR
031	CAPE GIRARDEAU	109	LAWRENCE	186	STE. GENEVIEVE
033	CARROLL	111	LEWIS	187	ST. FRANCOIS
035	CARTER	113	LINCOLN	189	ST. LOUIS
037	CASS	115	LINN	195	SALINE
039	CEDAR	117	LIVINGSTON	197	SCHUYLER
041	CHARITON	119	MCDONALD	199	SCOTLAND
043	CHRISTIAN	121	MACON	201	SCOTT
045	CLARK	123	MADISON	203	SHANNON
047	CLAY	125	MARIES	205	SHELBY
049	CLINTON	127	MARION	207	STODDARD
051	COLE	129	MERCER	209	STONE
053	COOPER	131	MILLER	211	SULLIVAN
055	CRAWFORD	133	MISSISSIPPI	213	TANEY
057	DADE	135	MONITEAU	215	TEXAS
059	DALLAS	137	MONROE	217	VERNON
061	DAVIESS	139	MONTGOMERY	219	WARREN
063	DE KALB	141	MORGAN	221	WASHINGTON
065	DENT	143	NEW MADRID	223	WAYNE
067	DOUGLAS	145	NEWTON	225	WEBSTER
069	DUNKLIN	147	NODAWAY	227	WORTH
071	FRANKLIN	149	OREGON	229	WRIGHT
073	GASCONADE	151	OSAGE	510	ST. LOUIS CITY
075	GENTRY	153	OZARK		
077	GREENE	155	PEMISCOT		